INSTRUCTION MANUAL FOR LEVEL SWITCHES SERIES 1020 Electric

1. INSTRUMENT DESCRIPTION

Level switches model 1020 have been conceived for horizontal set up in tanks by means of threaded or flanged connection. The standard model has been equipped with one or two electric contacts for high or low level emergency signal. We suggest to use model 1020 with clean liquids.
The instruments can be equipped with a "LEVEL CHAMBER" for use outside the tanks.

2. MODEL IDENTIFICATION

All the items we supply are always to be identified by means of a serial number placed on the item identification plate. Such plate is firmly secured on the item head.

Model		
	1A	Threated 2"
	1B	Threated 3"
	1Q	Square Flange 92x92
	2	Rating 150#
	4	Rating PN40
	6	Rating 300#

Body Material	
A	Carbon Steel
J	AISI 316

Float Material	
2	AISI 316

Contacts		
	M2	Basic
	M3	Current Continuos
	M4	Water proof
	M6	Water proof, gold contact
	M14	Ermet. sealed with inert gas

Housing	
WP	Water Proof IP66
EP	Explosion Proof EExd

Instrument Chamber	
Ø	Not previewed
CHA	Previewed

Not STD version	
xx	Not STD

102 ☐ ☐ ☐ ☐ ☐ ☐ ☐

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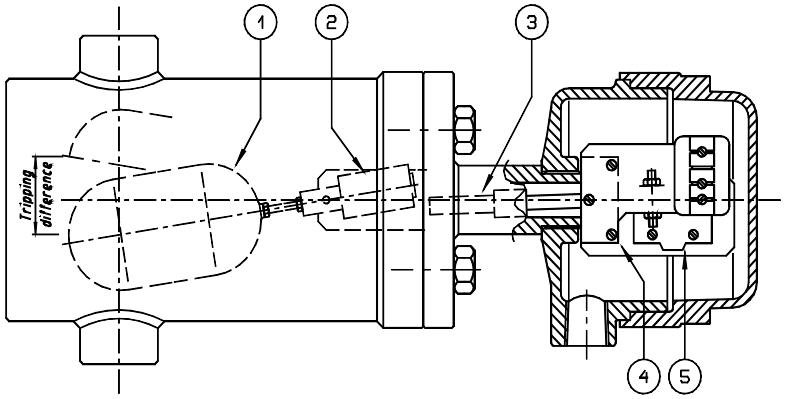
3. OPERATING PRINCIPLE

The whirling of liquid to be checked grants the moving UP/DOWN of the float (1) where a permanent magnet (2) is fastened. The magnet moving command a second magnet (3), which is placed on the release device (4) controlling the microswitch (5). A wall made of tank pressure-resisting amagnetic material is placed between both magnets. The differences in the level of the liquid between levels high and low is called “tripping difference



4. INSTALLATION

4.1 FITTING

Before installing the level switch, make sure that the tank and level switch connections are compatible.

It is strictly prohibited to load the instrument with external loads and it is the user’s duty to protect it from strain; do not use it as resting point. To avoid effects of galvanic corrosion, any use of materials featuring a different electrochemical potential is prohibited.

The user shall adopt all those technical devices that can prevent this event from occurring.

The system shall be equipped with the specified technical device, to make up for overpressure going beyond the maximum envisaged point.

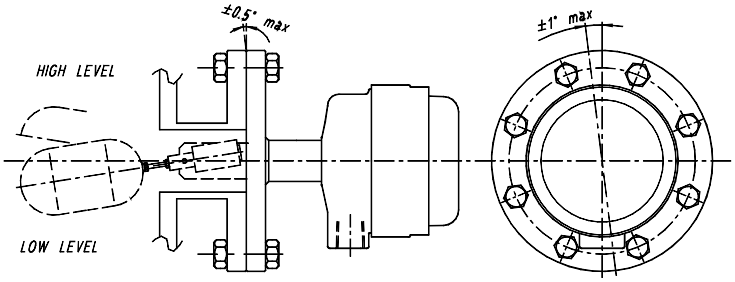
The instrument has to be set up **ALWAYS** with the electric connection downward.

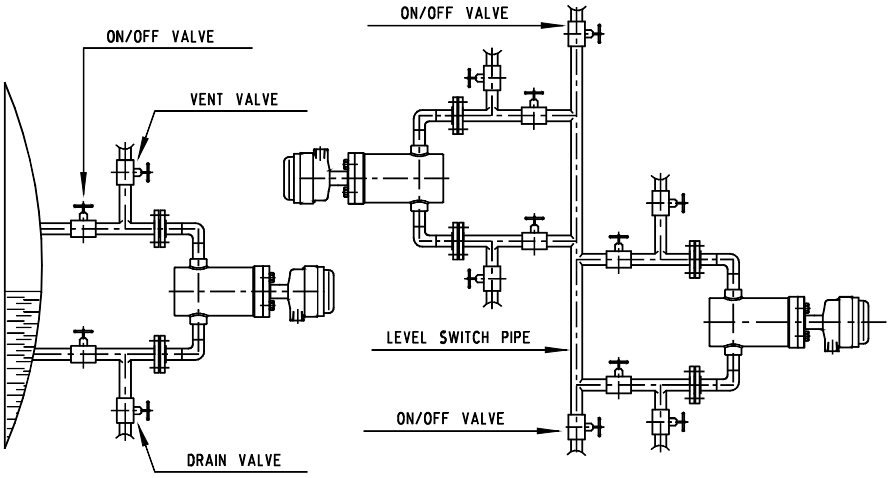
The instrument with “CHAMBER” we recommend using on/off valves that allow one to remove the instrument easily and drain valves to bleed off any deposits inside the instrument.

If air or steam pockets are likely, we recommend fitting vent valves in the upper unions.

If two or more instruments need to be fitted for regulation purposes, we recommend to fit these on the pipe to which the level switch is attached.

Please contact our Customer Services if the level switches have to be fitted on tanks subject to heavy vibrations





The insertion point on the tank shall be far enough from any obstacle compromising the space necessary for disassembly. Furthermore, the float inside the tank shall be placed in an area free from any liquid turbulence. in case this won’t be possible, protections will be provided in order to eliminate the mentioned turbulences.

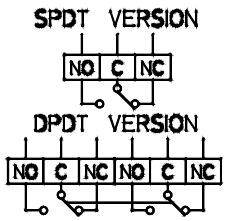
Always make sure the connection pipe is properly dimensioned, both in diameter and in length before installing the item (the float has to go into the tank); moreover, make sure the pipe is perfectly horizontally positioned (max. 0.5°) and if flanged, with max. 1° misalignment.

Make sure the internal structure of the pipe allows the correct up and down movement of the float.

ATTENTION. Make sure the magnet didn’t attract any metallic particle before installing the item.

4.2 WIRING

The level switch has a terminal board inside the case.
For NC - C - NO connections (see figure on the right).
Make sure that the cover of the housing is closed properly before powering up.
The user shall provide suitable ground connections that are such as to protect the staff and any other equipment possibly present.



NO=NORMALLI OPEN
C=COMMON
NC=NORMALLI CLOSE

5. COMMISSIONING

Make sure that the expected working loads do not exceed the acceptable loads (maximum pressure and temperatures, minimum specific weight) and that the mains voltage matches that indicated on the instrument ratings plate.
Check that the instrument trips correctly by changing the level of the liquid several times.

6. CALIBRATION

The instrument has been calibrated before leaving the factory and so requires no further calibration on installation.

7. MAINTENANCE

We recommend inspecting the level switch on a routine basis (every six months or so) to guarantee full efficiency.
All maintenance activities shall be performed when the instrument is off, not under pressure and emptied of its fluid, and at room temperature (in the event of instruments working at high or low temperature) and free from the contact's feeding voltage.
Checking is simple and quick; we have two kinds: inspection of the body/float and of the switch unit.

7.1 WARNINGS

- NEVER open the cover of the case before the power supply has been cut off;
- NEVER leave the case without its cover for more than the time absolutely necessary for the inspection;
- NEVER use the level switch with pressure or temperature levels in excess of those indicated on the ratings plate;
- NEVER use the level switch with mains voltage in excess of that indicated on the ratings plate;
- NEVER adjust or replace any components without having first read the relevant instructions carefully. If in doubt, contact our Customer Services;
- NEVER lubrificate instrument components;
- NEVER use the item in liquids having iron particle suspended. The magnet could attract them with consequent locking
- If being used with high temperatures (or low temperature "CRYOGENIC"), adopt all the relevant precautions to guarantee that service personnel are protected during maintenance operations.

7.2 ROUTINE INSPECTION OF THE FLOAT

Periodically clean the float (1) and the magnet (2) liquid side. Make sure no encrustation or dirt exists between magnet and process flange and also between magnet and fulcrum supports, hindering the free movement of the float.

- Make sure that the instrument has been cut off from the plant and all liquid has been drained.
- Cut off the power supply.
- Open the instrument by undoing the bolts and removing the tie-rods.
- Extract the float by raising the top flange on the body of the level switch (take care not to bend or damage the rod or the float).
- Check the body and check that it is clean and free of scaling and/or built-up dirt (carefully clean if necessary).

In cases when settlements are found that need to be removed, the float assembly must be dismounted as follows:

- Dismount the float by loosening the nut that locks it to the rod, measure the distance between the float and the hub before acting;
- Dismount the magnet assembly by removing the split pins and pull out the pivot;
- Clean the whole set and carefully put back in place the magnet unit and the float;
- Carefully remount the float assembly;
- Manually lift and lower the float and ensure that the whole set can slide freely;
- Ensure that the breaker assembly trips when the float is in the high-level position

7.3 ROUTINE INSPECTION OF THE CONTACTS

Cut off the power supply.

Dismount the case cover after loosening the lock-nut (6).

With the cover open, perform a visual inspection to ensure that the tripping unit does not show damaged or aged parts, actuate the control rod (7) and ensure that the micro switch (5) regularly performs the switchover operation

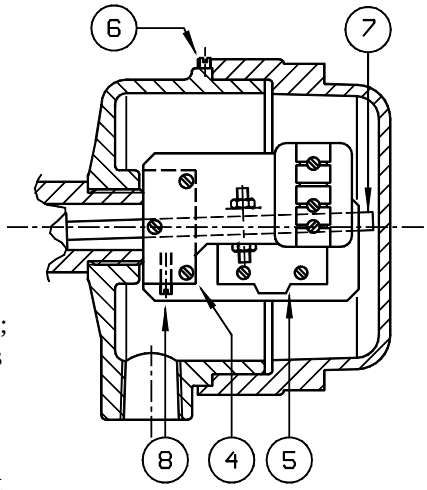
7.4 REPLACING THE UNIT AND/OR MICRO-SWITCH

Microswitches are part of the switch unit.

In case of functioning irregularity it is not possible to replace them singularly but together with the switch unit (4), supplied as standard spare part.

Please act as follows for switch unit replacement:

- Unscrew both screws (8) inside the sheath securing the switch unit to the pipe fitting;
- Remove the switch unit;
- Assemble the new switch unit;
- Tighten both screws (8) tightly;
- Ensure that the tripping unit is perfectly upright to the instrument axis;
- Check, by means of the control rod, that the miniature switch operates properly;
- Screw back the case cover and the related block.

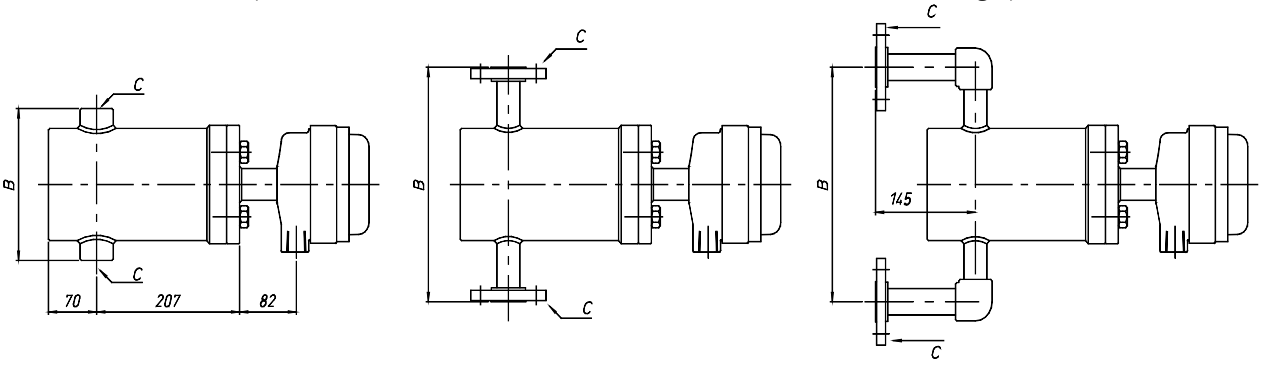


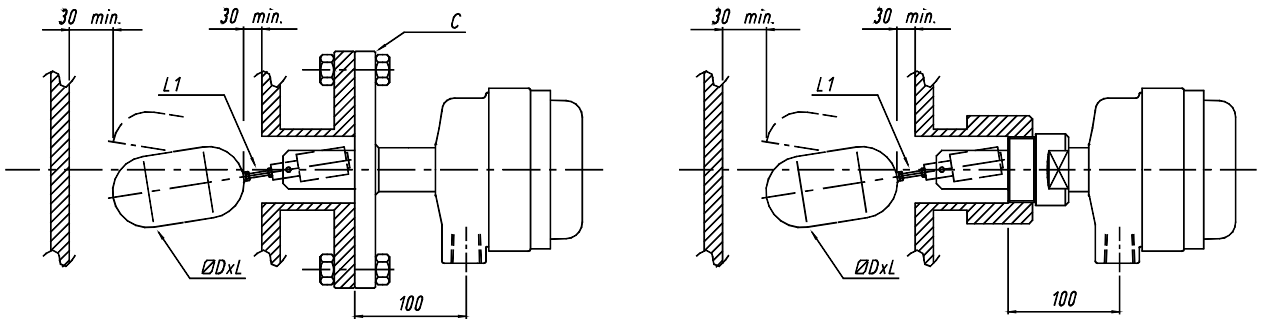
Once these actions are over, you need to check the complete instrument for correct functioning.

After putting the instrument back in place on the plant, carry out some simulations with the high or low level process fluid to check for proper indications.

8. DRAWINGS OF BODY WITH DIMENSIONS

Dimensions to order (**B** = field; **C** = connections; **ØDxL**=Float dimensions; **L1**=Rod length).

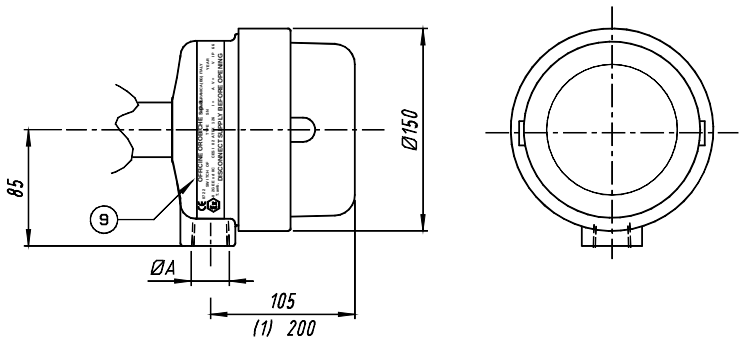




9. DRAWINGS OF CASE WITH DIMENSIONS

ELECTRIC CONNECTION Ø A	
EP (EExd)	WP (IP 66)
1/2” NPT	1/2” NPT
3/4” NPT	3/4” NPT
1/2” UNI 6125	1/2” (GAS) ISO 228/1
3/4” UNI 6125	3/4” (GAS) ISO 228/1
ISO M20 x 1.5	1/2” UNI 6125
	ISO M20 x 1.5

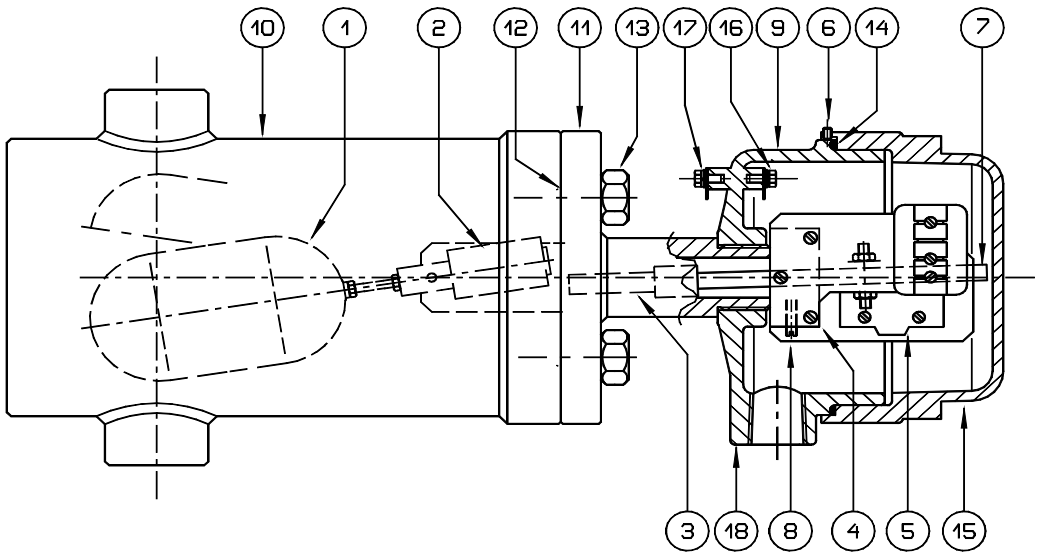
(1) Space needed for removing the case cover



10. RECOMMENDED SPARE PARTS (*)

	Pos.	Denomination
(*)	1	Float
	2	Magnet fluid side
	3	Magnet switch side
(*)	4	Switch unit
	5	Microswitches
	6	Screw fixing switch unit
	7	Action microswitch rod
	8	Screws fixing switch unit
	9	Instrument rating plate
	10	“LEVEL CHAMBER” instrument
	11	Instrument flangeconnection
(*)	12	Gasket body
	13	Tie-rods
(*)	14	Gasket housig case
	15	Case cover
	16	Internal ground unit
	17	External ground unit
	18	Case base

When ordering spare parts, always indicate the instrument’s serial number.
You can find it on the ratings plate on the case (see Fig. 9) and has five digits preceded by the letter “F” (e.g.: F45678).



11. TROUBLE-SHOOTING

Series 1020 level switches are not normally subject to malfunctions.
If the level switch fails to trip, check the float and the micro-switch as explained at paragraph 7 MAINTENANCE.
If, after all the checks and tests, the fault has not been found, please contact our customer service department.

12. DISPOSAL

Once the level switches have reached the end of their working life, they should be sent for disposal in accordance with prevailing regulations.
During their disposal, pay special attention to the polymers, resins and rubber used in their construction (PVC, PTFE, PP, PVDF, neoprene, viton etc.).
Metal components may be recycled after removing the gaskets, special coverings as requested by the customer or other plastic materials.

13. WARRANTY

All series 1020 level switches are guaranteed against manufacturer defects for a period of 12 months from the date of shipment.
In the event of a malfunction, if the defective part is returned within the above-mentioned warranty period, OFFICINE OROBICHE undertakes to replace any damaged parts under warranty (excluding transport costs), provided that the defect is not the result of the improper use of the instrument.
OFFICINE OROBICHE may not be held liable for any improper use of its products where these are used for ends other than those indicated in the specifications forming part of the order.
No claims for damages will be accepted in the case of improper use.
Damages and/or expenses, whether direct or indirect, arising from improper installation or use of the instrument shall not be attributable or debited to OFFICINE OROBICHE under any circumstance.
The instrument may be used for a maximum period of 10 years from the date of delivery.
After said period, the customer has two alternatives:

1) Replace the instrument with a new one.
2) Have the instrument overhauled by OFFICINE OROBICHE.

HOW TO RETURN INSTRUMENTS

Any returned instruments must be accompanied by a sheet indicating:

1) The name of the customer;
2) A description of the material;
3) Details of the fault;
4) Process data;
5) Liquids with which the instrument has come into contact;

The returned instrument must be perfectly clean, free of dust and deposits; otherwise, OFFICINE OROBICHE may reserve the right to refuse to carry out the required maintenance and return the item “as found” to the customer.

FINAL NOTES

Every instrument is supplied fully assembled with all the accessories requested by the customer.
Only in exceptional cases will the various components be supplied separately.
We therefore recommend that the customer inspects the delivery on arrival and immediately notifies OFFICINE OROBICHE of any discrepancies.

N.B. IN CASES WHEN THE INSTRUMENTS ARE MEANT TO BE USED IN AREAS FEATURING POTENTIALLY EXPLOSIVE ATHMOSPHERES, THE USER SHALL COMPLY WITH THE **ADDITIONAL SAFETY INSTRUCTIONS** ATTACHED TO THE STANDARD ONES.